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SURVEY OF VERTEBRATE REMAINS FROM PREHISTORIC SITES IN THE SAVANNAH RIVER VALLEY

ELIZABETH J. REITZ
Department of Anthropology
University of Georgia
Athens, GA 30602

ROCHELLE A. MARRINAN
Department of Anthropology
Florida State University
Tallahassee, FL 32306

SUSAN L. SCOTT
Department of Sociology and Anthropology
University of Southern Mississippi
Box 5074, Southern Station
Hattiesburg, MI 39406-5074

ABSTRACT.—Faunal remains from six sites located in the Savannah River Valley were examined. While these samples represent four of the physiographic regions of the valley, temporal coverage for each region is limited. The samples appear to show a similar pattern of faunal use throughout the valley, except in the upper reaches of the Savannah estuary. These similarities seem to transcend temporal parameters. Analysis of the piedmont data suggests a subsistence strategy which incorporated a wide variety of vertebrate resources into the diet, but emphasized venison as the primary source of meat. Riverine resources were also extensively used. In the estuarine end of the river valley, however, subsistence efforts produced a diverse faunal assemblage in which fish and mammals other than deer were important. It appears unwise to extend patterns derived from piedmont sites to coastal sites and vice versa. A survey of these data clearly demonstrates that much research remains to be done in the valley in order to understand subsistence patterns.

INTRODUCTION

In spite of intensive archaeological interest in human occupation of the Savannah River Valley, remarkably little data other than site location are available for study of human subsistence strategies. One factor contributing to this situation is that much of the Piedmont portion of the river valley was flooded after construction of hydroelectric installations and prior to development of subsistence models requiring controlled collection of biological samples. Further, such important sites as Stallings Island and the Irene Mound were excavated at a time when research was primarily focused on chronological problems. Hence, many of the well-known sites from the valley were either lost or excavated before subsistence questions were clearly formulated and a strategy for answering them with biological data developed. Additionally, preservation of plant and animal remains has been poor at many sites. Hence not only are there no complete biological collections and few faunal ones available for study, it is unlikely that this situation will improve substantially in the future. It is therefore important to take advantage of every opportunity to examine well preserved biological collections which have been excavated from the valley, and to encourage maximum recovery of biological materials from excavations in the future.

A review of the literature has produced six quantified reports of vertebrate fauna from prehistoric sites in the Savannah River Valley (Fig. 1)—the Second Refuge site (38JA61), Rabbit Mount (38AL16), G.S. Lewis Site (38AK228), Beaverdam Creek (9EB85), Clyde Gulley (9EB387), and Rucker's Bottom (9EB91). The samples represent four of the physiographic regions of the valley and several temporal affiliations. It therefore may be possible to summarize our understanding of subsistence strategies in the valley using faunal evidence much as has been done using site location (e.g. Stoltman 1974; Hanson *et al.* 1978; Brooks *et al.* 1986).

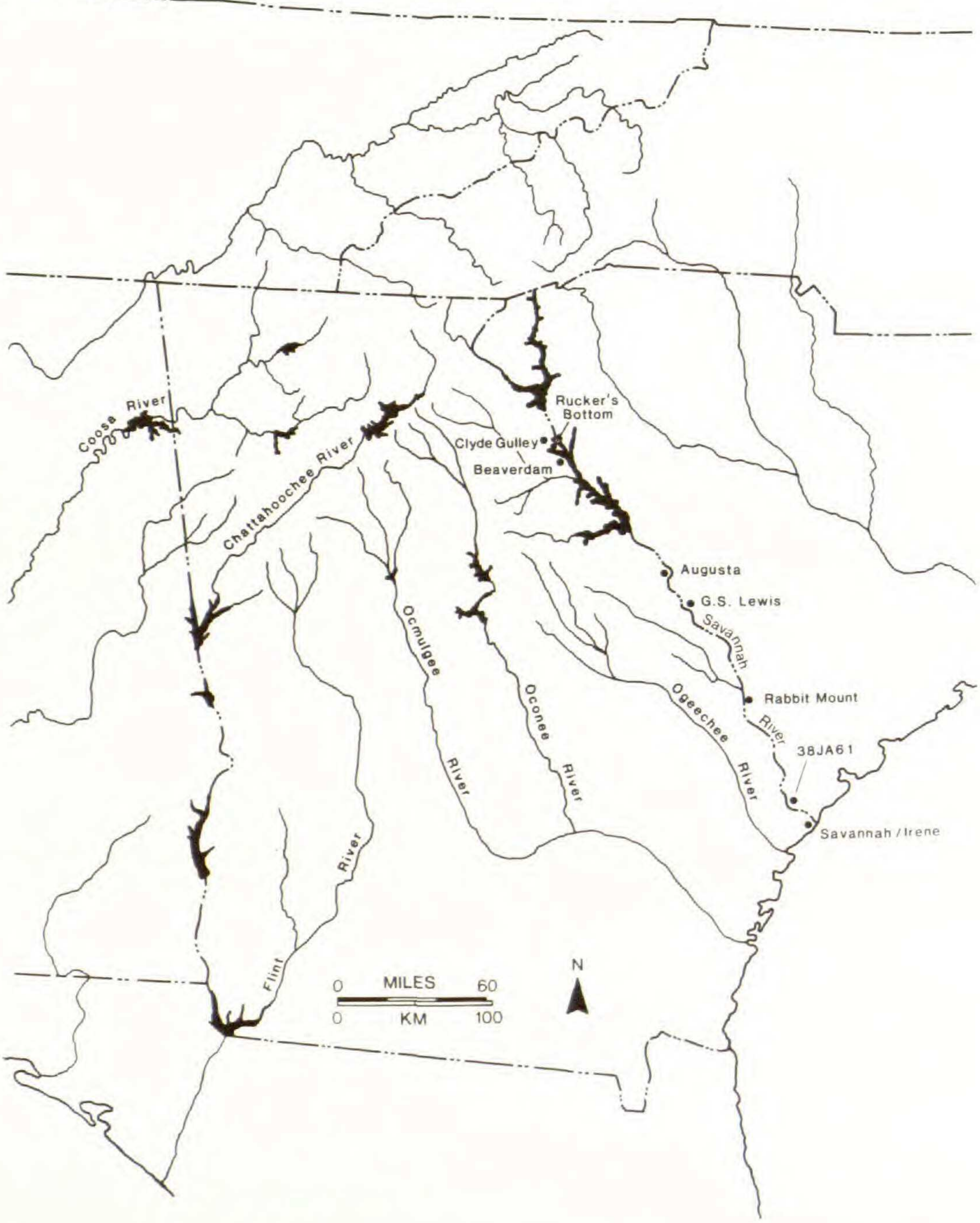

Figure 1.—Savannah River Valley.

When the six vertebrate samples are compared it can be seen that a number of factors hinder reliable comparisons, one of which is different recovery methods. At least 1/8-inch mesh was used at five of these sites but no screen was used at Rabbit Mount. Differences in the faunal assemblages between Rabbit Mount and the other collections could be attributed to differences in recovery techniques. However, we are fortunate that techniques were used which generally recovered the full size range of exploited vertebrates. It also appears that while some of the materials have been recovered from village middens, others have been excavated from ceremonial mounds and may represent secondary deposits brought in from elsewhere.

More important, however, is the lack of data for all of the temporal and physiographic settings in the valley. Although the samples available for study are from sites with well documented physiographic context and most samples are dated to within a 200 year time frame, evidence for each time period is not represented by equal sized samples from each of the ecological zones. This characteristic of the data is a source of error for interpreting Savannah River Valley subsistence patterns which is important to remember, and the need for replication for temporal and physiographic settings is not satisfied. Since the smaller temporal components at these multi-component sites are highly variable in volume of faunal remains, and since the goal here is a synthesis, the materials from each site are best used as examples of subsistence during gross chronological periods such as Mississippian instead of finer ones such as the Lamar phase, although the finer chronological units will be used here when possible.

In the review which follows, Minimum Numbers of Individuals (MNI) is used as the comparative unit because it is the most consistently reported for the sites from the valley. MNI is subject to a number of problems, among which is sample size bias. Samples of less than 200 individuals are often considered too small for reliable interpretations (Wing and Brown 1979:119), because the species list is too short and the abundance of one species in relationship to others is probably somewhat inaccurate. The criterion of 200 individuals was developed using primarily Caribbean coastal samples. Sites characterized by a marine oriented subsistence base tend to be more diverse than continental sites. It is probable that larger collections are needed for coastal sites in order to assess the extent of that diversity. Faunal collections from sites in less diverse environments, such as those in which most of the sites reviewed here were located, may be naturally less diverse and hence smaller samples may be adequate. In order to test this proposition several samples which are unquestionably more than adequate would be needed, and these are not available for the valley. The number of fragments per taxon (NISP) is also provided.

The abundance of at least two of the identified taxa is probably underestimated by MNI. Both turtles and gar were identified primarily from unpaired elements: carapace and plastron fragments for turtles and scales for gars. Considering the high bone count for these taxa, the number of individuals estimated in these collections seems too low.

When comparisons such as this are made, differences in sample size are an important source of bias. Comparing either MNI or NISP demonstrates a wide variation in sample size among the collections. Analysis of samples as small as that for the Archaic component at Rucker's Bottom is questionable (MNI = 7, NISP = 78; Scott 1985) and comparing it to larger samples is even more risky. While temporal components are obviously important, the uneven faunal representation from these different time periods makes analysis of subsistence through time in the river valley sketchy.

In order to discuss diet, biomass was determined for the four larger samples. In these cases, biomass was determined using allometric relationships and linear regression (Reitz and Cordier 1983; Reitz *et al.* 1987; Wing and Brown 1979:127-135). The formulae used are presented in Table 1.

Table 1.—*Allometric Values Used in Study*[a].

Faunal Category	N	Y-Intercept	Slope	r^2
		Bone Weight to Body Weight		
Mammal	97	1.12	0.90	0.94
Bird	307	1.04	0.91	0.97
Alligator	3	0.91	0.89	0.89
Turtle	26	0.51	0.67	0.55
Snake	26	1.17	1.01	0.97
Osteichthyes	393	0.90	0.81	0.80
Non-Perciformes	119	0.85	0.79	0.88
Siluriformes	36	1.15	0.95	0.87
Centrarchidae	38	0.76	0.84	0.80

[a]Key to abbreviations: Formula is $Y = aX^b$; where y is biomass, x is bone weight, a is the Y-intercept; and b is the slope; N is the number of observations. (Reitz and Cordier 1983; Reitz *et al.* 1987; Wing and Brown 1979.)

One methods by which variety and degree of specialization in the samples can be compared is to calculate the diversity and equitability of the species identified from each site (Hardesty 1975). Diversity measures the number of species used at the site. Equitability measures the degree of dependence on the utilized resources and the effective variety of species used at the site based upon the even, or uneven, use of individual species. Use of these indices allows discussion of food habits in terms of the variety of animals used at the site (richness or diversity) and the equitability (evenness) with which those species were utilized.

Diversity can be calculated through use of the Shannon-Weaver Index. The formula for the index is:

$$H' = -p_i \log_e P_i$$

where P_i is the number of *ith* species divided by the sample size (Pielou 1966; Shannon and Weaver 1949:14). P_i is actually the evenness component since the Shannon-Weaver Index measures both how many species were used and how much each was utilized. Diversity can be calculated both for MNI and for biomass.

Equitability is calculated using the formula:

$$E = H' / H \max$$

where *H'* is the Diversity Index and *H max* is the natural log of the number of observed species (Pielou 1966; Sheldon 1969). Equitability can be determined for both MNI and biomass.

Interpretation of the indices can be difficult. Basically diversity increases as both the number of species and the equitability of species abundance increases. A diversity index of 4.99 is the highest possible value. A sample with many species identified and in which the number of individuals slowly declines from most abundant to least abundant will be high in diversity. Diversity can be increased by adding a new taxon to the list; but if another individual of an already present taxon is added, diversity is decreased.

A low diversity can be obtained either by having few species, or by having a low equitability, where one species is considerably more abundant than another. Low equitability indicates that one species was more heavily used than other species in the sample. High equitability, approaching 1.0, indicates an even distribution of species in the sample following a normal pattern where there are a few abundant species, a moderate number of common ones, and many rare ones. It is important to note that diversity and equitability are dependent upon sample size (Grayson 1981:82-85, 1984) and are not more reliable than the derived data (MNI, bone weight, bone count, biomass) used in generating the indices.

Reference is occasionally made to season of occupation, which was estimated in several ways. One method was based on the seasonal habits of the taxa identified. None of the animals identified from the sites hibernate during the winter, although some may become scarce or less active. Another method was based on the age of deer evidenced by the degree of epiphysial fusion for selected elements. Along the area of growth the shaft and epiphysis are not fused. Growth is complete and fusion occurs in a regular temporal sequence (Gilbert 1980; Schmid 1972; Silver 1963), although environmental factors influence the age at which fusion is complete. Age was also determined by the eruption sequence and degree of wear of teeth.

The species identified were summarized into faunal categories. Although mammals are primary terrestrial resources, many identified in these collections are generally associated with damp, bottom-land conditions. Others, such as beaver, are primarily found in aquatic situations, although they may be found on land. Wild birds include the turkey and other taxa which are primarily terrestrial as well as ducks, which are primarily aquatic. With the exception of the box turtle, all of the turtles are aquatic resources. However, aquatic turtles may also be found on land during their nesting seasons and box turtles are found in low-lying areas. The summary categories also include taxa such as dogs and shrews which may have been commensal. While these animals could have been used for food as noted for other collections, there are no modifications to the bones from these sites which would clearly suggest that they represent food remains.

THE SAVANNAH RIVER VALLEY

The Savannah River flows southeast from its origin in the Blue Ridge Mountains in South Carolina to Georgia then to the Atlantic Ocean near the city of Savannah, Georgia, traversing Mountain, Piedmont, and Coastal Plain physiographic regions. The Mountain Province has a variable topography of rugged mountains, small plateaus, and narrow, winding valleys with elevations between 609 and 1220 m above sea level (Cooley 1974:3-7). The Piedmont Province, an area of rolling hills, ranges in elevation from 609 m in the foothills to about 122 m at the Fall Line. The Fall Line represents the Atlantic shoreline during its last transgression and the Coastal Plain is an emerged portion of the Continental Shelf. The Coastal Plain is generally flat, although the Savannah River valley is characterized by a series of high bluffs which rise from 16 km south of Augusta, Georgia, to about 40 km north of Savannah (Cooley 1974:5). The Upper Coastal Plain is a region of sand hills with unconsolidated sedimentary Miocene deposits of marine origin. The Lower Coastal Plain is a Pleistocene terrace of unconsolidated sands and clays. At its mouth the river forms a complex estuarine system similar to others along the Georgia and South Carolina coast. The upper reaches of that system are characterized by lower salinity ranges while the lower reaches have higher salinity ranges (Dahlberg 1975:113). Both areas are affected by tidal flow. Before entering the estuary, the river valley is narrow and deeply incised with a restricted floodplain. Meanders are present but are not common.

Human occupations in the Savannah River valley are divided into the same temporal periods as elsewhere in the Eastern United States, with temporal phases reflecting local lithic and ceramic assemblages (Stoltman 1974; Anderson *et al.* 1986). Although the sequence begins with Paleo-Indian, it is not until the Archaic Period that sites are common. The Archaic economy was based upon hunting, gathering, and fishing. Archaic sites have been found associated with large stream systems although upland areas probably were also used (Stoltman 1974; Hanson *et al.* 1981:10, 15). Early Woodland sites (referred to as Refuge Phase on the coast) were occupied between 1000 BC and 500 BC. The locations of Refuge sites appear to be similar to those of the Late Archaic, with sites on floodplain terraces and upland areas (Hanson *et al.* 1981:11). Middle Woodland (Deptford Phase on the coast) sites were occupied from about 500 BC to AD 500. Deptford sites are found along river terraces and floodplains as well as in upland areas (Hanson *et al.* 1981:13). The location of Deptford sites suggests that there may have been less use of floodplain than upland resources (Hanson *et al.* 1981:16). The Late Woodland and Mississippian Periods date from approximately AD 700 into the historic period (Anderson *et al.* 1986). Savannah I Phase sites were occupied during the Late Woodland on the coast. Above the Fall Line Savannah I sites are rare, and appear to have been occupied too late to be classified as Late Woodland. Mississippian (Savannah II Phase) sites are associates with domesticated crops. Interior sites occupied during the Mississippian are classified locally as Lamar, a phase which begins somewhat earlier than the coastal Mississippian Savannah II Phase. Mississippian sites are found on terraces and floodplains, but there is greater use of upland areas than previously.

THE COAST

No quantified faunal data are available from the lower reaches of the Savannah River estuarine system, however they are available from a site in the upper reaches of that system. (For a review of representative estuarine data see Reitz 1982). The Second Refuge Site (38JA61) lies within the Savannah National Wildlife Refuge near present-day River Mile 20, in the lower coastal plain. It was found during a survey of the wildlife refuge in 1978 (Marrinan 1979) and is named for its chronological affiliation and close association with the Refuge site reported by Waring (in Williams 1968). The site is a shell midden located on the east side of the river channel in marshy surroundings that evidence extensive alteration for waterfowl habitat management. Much of the current system of dikes and canals is based upon antebellum alterations for wet rice production. The west edge of the midden has been cut by a dredged canal.

Because of planned dike renovation, which included redreging the canal, the site was excavated by Larry Lepionka in 1979. The results of this excavation were somewhat surprising. The total depth of deposit was 2.5 meters. Invertebrate midden constituents were largely freshwater mussels and snails, but considerable estuarine fauna was present. A small sample of the 1979 vertebrate fauna (1,017 fragments) was analyzed by Marrinan (1980). Among the vertebrate fauna, the expected riverine species were present along with marine and estuarine species.

A second excavation was undertaken in 1980 (Lepionka *et al.* 1983). At this time, a more systematic collection of fauna was made using both 1/4-inch and 1/8-inch screen. The 1980 sample comprised in excess of 47,296 fragments recovered from 1 x 1 meter units excavated in 10 cm levels. Faunal material was collected in 1/4-inch and 1/8-inch screens. For this study, all of the faunal remains from the 1/4-inch screen was analyzed and a single bag from each 10 cm level was analyzed for the 1/8-inch screen.

The bulk of the deposit (Levels 12-25) was designated Refuge Phase (ca. 1000-500 BC). A radiocarbon assay of shell at the midden base was dated 1070 BC ± 115 (QC-784)

(Lepionka *et al.* 1983:38). Two levels were designated Deptford Phase (10-11) and seven levels at post-Deptford (3-9). A second date, 510 BC ± 110 (QC-785) was obtained from one meter above the midden base, approximately Level 15 (Lepionka *et al.* 1983:38). All of the materials reported here are Refuge Phase. Faunal data organized by individual levels are included in Lepionka *et al.* (1983).

The umbos of all bivalves were retained from the 1/4-inch screen in order to calculate invertebrate MNI. The most common invertebrate taxon throughout the occupation was the freshwater mussel, *Elliptio icterina* (MNI = 32,869). Oysters, *Crassostrea virginica* (MNI = 2985), were the most abundant estuarine invertebrate but were numerically less common than *Elliptio* in every level. Although fluctuations in the freshwater mussel/marine oyster ratio occur, oysters are never more than 34% of the invertebrate MNI and freshwater mussels are never less than 58% of the invertebrate MNI. Contrary to the interpretation of these data made by Brooks and his colleagues (1986) and by Claassen (1986), oysters are never the dominant invertebrate resource nor do these data suggest shifts from estuarine to freshwater regimes, particularly in the upper levels (Lepionka *et al.* 1983:231). Gastropod invertebrate MNI was based on specimens recovered in largely whole condition. Snails, *Viviparus georgianus* (MNI = 726), were present in minor quantities. Two crab fragments also were recovered.

Table 2 presents the species list for the 1980 collection. Some 61 taxa, representing at least 115 vertebrate individuals were identified in the 47,296 fragments. MNI and biomass for the sample are summarized (Tables 3 and 4). Deer was the dominant mammalian taxon, representing 17% of the 29 mammal individuals. In a consideration of biomass, the overwhelming importance of mammalian fauna is apparent (71% of the biomass for which MNI was estimated) with deer alone contributing 59% of the biomass.

Table 2.—*38JA61: 1980 Composite Species List.*

Taxon	Cnt	MNI		Weight	Biomass	
		#	%	(gm)	kg	%
UID Large Mammal	616			797.9	14.4962	21.7
UID Mammal	905			324.7	6.6079	9.9
Didelphis virginiana Opossum	22	5	4.4	15.4	0.3994	0.6
cf. *Sylvilagus* spp. possible Rabbit	3	1	0.9	0.5	0.0150	0.02
Sylvilagus spp. Rabbit	26	6	5.2	16.6	0.4109	0.6
UID Rodent	55	2	1.7	5.4	0.1574	0.2
cf. *Sciurus* spp. possible Squirrel	2			0.5	0.0140	0.02
Sciurus spp. Squirrel	3	1	0.9	0.5	0.0155	0.02
Castor canadensis Beaver	15	1	0.9	31.0	0.6859	1.0
cf. *Oryzomys* spp. possible Rice rat	2	1	0.9	0.3	0.0094	0.01

Table 2.—*38JA61: 1980 Composite Species List.* (continued)

Taxon	Cnt	MNI		Weight	Biomass	
		#	%	(gm)	kg	%
Ursus americanus Black bear	1	1	0.9	9.7	0.2032	0.3
Procyon lotor Raccoon	59	4	3.5	37.7	1.0915	1.6
Lontra canadensis Otter	2	1	0.9	2.2	0.0534	0.08
Felis rufus Bobcat	2	1	0.9	7.1	0.1577	0.2
Artiodactyla	48			315.8	5.4611	8.2
Odocoileus virginianus Deer	208	5	4.4	873.7	15.4302	23.1
UID Bird	21	3	2.6	15.4	0.2277	0.3
UID Reptile	4			0.6	0.0134	0.02
Alligator mississippiensis Alligator	2	1	0.9	2.1	0.0344	0.05
cf. Turtle	1			1.1	0.0337	0.05
UID Turtle	2754			414.8	5.3684	8.0
Chelydra serpentina Snapping turtle	5	1	0.9	3.0	0.0878	0.1
Kinosternidae Mud and Musk turtles	158	9	7.8	44.1	1.0241	1.5
Kinosternon spp. Mud turtle	4			2.2	0.0682	0.1
cf. *Sternotherus* spp. possible Musk turtle	2			2.0	0.0503	0.08
Emydidae Pond and Box turtles	130	4	3.5	66.1	1.1488	1.7
cf. *Pseudemys* spp. possible Pond turtle	16			12.2	0.2411	0.4
Pseudemys spp. Pond turtle	28			25.9	0.4856	0.7
cf. *Terrapene carolina* possible Box turtle	2			1.0	0.0390	0.06
Terrapene carolina Box turtle	14			9.7	0.1449	0.2
Trionyx ferox Softshell turtle	7	1	0.9	27.2	0.4148	0.6

Table 2.—*38JA61: 1980 Composite Species List.* (continued)

Taxon	Cnt	MNI #	MNI %	Weight (gm)	Biomass kg	Biomass %
Iguanidae Lizards	2	1	0.9	0.2	0.0026	tr
UID Snake	829			59.5	0.8477	1.3
Colubridae Non-poisonous snakes	11			1.0	0.0188	0.03
Farancia spp. Mud snake	1	1	0.9	0.6	0.0082	0.01
Nerodia spp. Water snake	5	1	0.9	0.9	0.0122	0.02
cf. Viperidae possible Pit Vipers	1	1	0.9	0.4	0.0095	0.01
Amphiumidae Salamanders	8	1	0.9	0.8	0.0105	0.02
Anura Frog/Toad	3	1	0.9	1.5	0.0205	0.03
Chondrichthyes Cartilaginous fishes	4			0.6	0.063	0.09
Selachii Sharks	6	1	0.9	0.8	0.1007	0.2
Galeocerdo cuvieri Tiger shark	1	1	0.9	0.3	0.0447	0.07
Rajiformes Skates and Rays	16	2	1.7	3.0	0.4301	0.6
UID Fish	8637			317.8	5.7717	8.6
Acipenser spp. Sturgeon	4	1	0.9	1.4	0.0447	0.07
Lepisosteus spp. Gar	813	2	1.7	57.8	1.4278	2.1
Amia calva Bowfin	789	9	7.8	59.1	1.4837	2.2
Siluriformes Catfishes	581	33	28.7	70.3	1.031	1.5
Ictaluridae Bullhead catfishes	28			8.7	0.1691	0.3
Ictalurus spp. Bullhead catfish	20			5.0	0.0992	0.2
Ariidae	29			15.0	0.276	0.4

Table 2.—*38JA61: 1980 Composite Species List.* (continued)

Taxon	Cnt	MNI #	MNI %	Weight (gm)	Biomass kg	Biomass %
Sea catfishes						
Ariopsis felis	1			0.1	0.0022	tr
Hardhead catfish						
Bagre marinus	77			8.8	0.1771	0.3
Gafftopsail catfish						
Centrarchidae	34	9	7.8	7.6	0.1404	0.2
Sunfishes						
cf. *Lepomis* spp.	3			1.1	0.022	0.03
possible Sunfish						
cf. *Micropterus* spp.	2			0.6	0.0097	0.01
possible Bass						
Micropterus spp.	2			0.2	0.0050	0.01
Bass						
Sciaenops ocellatus	1	1	0.9	0.5	0.0232	0.03
Red drum						
Mugil spp.	4	1	0.9	0.4	0.0160	0.02
Mullet						
Sphyraena barracuda	2	1	0.9	0.2	0.0080	0.01
Barracuda						
UID Vertebrate	30265			530.4		
TOTALS	47296	115		4221.0	66.8662	

Table 3.—*MNI Summaries.*

	38JA61 MNI	38JA61 %	G.S. Lewis MNI	G.S. Lewis %	Beaverdam MNI	Beaverdam %	Rucker's MNI	Rucker's %
Deer	5	4.4	34	26.4	35	21.7	137	35.8
Other Mammals	24	20.9	23	17.8	24	14.9	47	12.3
Birds	3	2.6	5	3.9	11	6.8	24	6.3
Turtles/Alligator	16	13.9	19	14.7	33	20.5	65	17.0
Snakes/Lizards	4	3.5	2	1.6	7	4.4	27	7.1
Amphibians	2	1.7	3	2.3	3	1.9	22	5.7
Sharks/Fishes	61	53.0	41	31.8	48	29.8	61	15.9
Commensal Taxa	—		2	1.6	—		—	
TOTALS	115		129		161		383	

Table 4.—*Biomass Summaries.*

	38JA61		G.S. Lewis		Beaverdam		Rucker's	
	kg	%	kg	%	kg	%	kg	%
Deer	15.4302	58.5	30.5014	85.9	36.23	86.5	48.08	86.2
Other Mammals	3.1993	12.1	1.5381	4.3	0.66	1.6	2.39	4.3
Birds	0.2277	0.9	0.4614	1.3	1.52	3.6	2.57	4.6
Turtles/Alligator	2.7099	10.3	2.3182	6.5	2.58	6.2	2.05	3.7
Snakes/Lizards	0.0325	0.1	0.0124	0.03	0.05	0.1	0.15	0.3
Amphibians	0.0310	0.1						
Sharks/Fishes	4.7503	18.0	0.4513	1.3	0.84	2.0	0.54	1.0
Commensal Taxa			0.2350	0.7				
TOTALS	26.3809		35.5178		41.88		55.78	

Avian remains were rare in the sample and none were identified to species. The MNI for birds is based on variation in fragment size rather than paired elements. Reptilian fauna was abundantly represented, particularly turtles. Turtles and alligator contributed 10% of the biomass calculated for this sample. Six turtle species were present, representing a minor range of habitats limited to the riverine environment. Sharks and fishes contributed 18% of the biomass, although cartilagenous fishes were present in only small quantities. Greatest MNI production may be seen among the bony fish with 57 individuals identified. Bony fishes such as sturgeon, bowfin, catfishes, and basses represent riverine taxa, but the collection also includes redfish, mullet, and barracuda from the estuarine environment. Redfish and barracuda are more reliable marine indicators since mullet will inhabit freshwater river systems. Barracuda is represented by teeth which had been utilized, perhaps for sawing. These remains may indicate an item of trade or a curated tool rather than subsistence activity.

Diversity and equitability of 38JA61 (Table 5) suggest that a modest range of species were present in the collection, but that most taxa were present in relatively even numbers, except for catfishes. However, the fact that catfishes contributed 29% of the individuals in the sample, reduced the collection's diversity and equitability. The prominence of venison in the collection in reflected in the low diversity and moderate equitability based on biomass. It is apparent, however, that this collection is more diverse and equitable in terms of biomass than others to be discussed in the following pages although the subsistence strategy was obviously selective in the use of available resources.

THE COASTAL PLAIN

One of the better known collections from the Savannah River Valley is located on the middle coastal plain approximately 30 miles upstream from Savannah, Georgia. Rabbit Mount (38AL15) on the river floodplain of Groton Plantation, South Carolina was occupied during the Late Archaic and Woodland Periods, and was excavated in 1964 (Stoltman 1974). The bulk of the shell midden sample is from the Late Archaic Stallings Island Phase, although Stoltman reports that few differences are found above, within, or below the Stallings Island shell midden (1974:144). Faunal remains were recovered by troweling without screens, thereby limiting recovery of small mammals, birds, reptiles, and fish. Bone counts and elements are reported although bone weight is not.

Table 5.—*Diversity and Equitability.*

	Number of Taxa	MNI	Diversity	Equitability
38JA61	35	115	2.8310	0.7963
Lewis Site	30	129	2.7950	0.8218
Beaverdam Creek	33	161	2.8822	0.8243
Rucker's Bottom	51	383	2.8700	0.7300

	Number of Taxa	Biomass	Diversity	Equitability
38JA61	35	26.8662 kg	1.8038	0.5073
Lewis Site	29	35.5178 kg	0.7917	0.2351
Beaverdam Creek	32	41.9047 kg	0.7157	0.2065
Rucker's Bottom	48	55.7772 kg	0.7380	0.1906

The collection contained 2,148 bones and at least 66 mammalian individuals (Stoltman 1974:145). Stoltman (1974:141) estimated that 63% (66% of the fragments) of the vertebrate portion of the diet was contributed by deer. Other mammals included opossum, rabbit, beaver, muskrat, gray fox, raccoon, skunk, otter, and bobcat. These contributed 6% of the fragments in the collection. Birds contributed 5% of the fragments, with turkey and quail the only birds identified. Stoltman reported that turtles contributed 19% of the fragments, with snapping turtles being the most common turtle by bone count. Turtles also included mud or musk turtles, box turtles, pond turtles, and softshell turtles. Fishes identified were gar, bowfin, and bullhead catfish. Fishes contributed 4% of the fragments. This collection was interpreted as evidence of the importance of terrestrial vertebrate resources, although aquatic vertebrates and invertebrate resources were also used.

The G.S. Lewis site (38AK228) is located in the Savannah River Plant in the upper coastal plain and was excavated by the South Carolina Institute of Archaeology and Anthropology under the direction of Glen Hanson (1985). Deposits from the site date from the Late Archaic through Late Woodland Period. The faunal materials reported here are associated with a Woodland or Deptford Phase village. Materials were recovered with 1/4-inch and 1/8-inch screens. In calculating MNI the field specimens associated with features were analyzed as independent observations. The remaining non-feature deposits were analyzed as a single observation. When possible, elements were measured following criteria established by Driesch (1976) and these are reported elsewhere (Reitz and Frank 1985).

Analysis of the Lewis site sample indicates heavy use of deer, with a wide range of other taxa supplementing the vertebrate based portion of the diet (Tables 3, 4, and 6). Fish contributed 32%, deer 26%, and other mammals 18% of the individuals. Reptiles were the other major group of animals used, with the percentage of turtle individuals included in the collection similar to that for turtle fragments identified from Rabbit Mount. The only birds identified were turkeys. Commensal taxa identified included a dog, identified from a single tooth, and a short-tailed shrew. In terms of biomass, deer were the major contributor to the diet. All other taxa were minimal contributors by comparison. Based on biomass, turtles were the major secondary resource, followed by other mammals, turkeys, and fishes.

Table 6.—*Lewis Site: Species List.*

Taxon	Cnt	MNI		Weight	Biomass	
		#	%	(gm)	kg	%
UID Mammal	4964			3116.93	38.977	50.4
Didelphis virginiana Opossum	5	3	2.3	7.33	0.1753	0.2
Blarina brevicauda Short-tailed shrew	1	1	0.8	0.02	0.0008	tr
Sylvilagus spp. Rabbit	5	3	2.3	5.97	0.1313	0.2
Sciurus spp. Squirrel	4	3	2.3	0.31	0.0099	0.01
cf. *Castor canadensis* possible Beaver	1			0.50	0.0141	0.02
Castor canadensis Beaver	14	3	2.3	17.80	0.3615	0.5
Ondatra zibethicus Muskrat	1	1	0.8	1.49	0.0377	0.05
Carnivore	1			0.18	0.0056	0.01
Canis familiaris Dog	1	1	0.8	11.35	0.2342	0.3
cf. *Urocyon cinereoargenteus* possible Gray fox	1			0.79	0.0213	0.03
Urocyon cinereoargenteus Gray fox	5	3	2.3	4.52	0.1065	0.1
Ursus americanus Black bear	3	2	1.6	11.29	0.2455	0.3
cf. *Procyon lotor* possible Raccoon	2			0.62	0.0171	0.02
Procyon lotor Raccoon	15	3	2.3	14.32	0.3116	0.4
cf. *Mephitis mephitis* possible Striped skunk	1	1	0.8	0.31	0.0092	0.01
Felis concolor Cougar	2	1	0.8	6.90	0.1496	0.2
Equus spp. Horse	1			58.70		

Table 6.—*Lewis Site: Species List.*

Taxon	Cnt	MNI		Weight	Biomass	
		#	%	(gm)	kg	%
cf. *Odocoileus virginianus* possible Deer	11			23.17	0.4451	0.6
Odocoileus virginianus Deer	807	34	26.4	2289.29	30.5014	39.4
UID Bird	45			20.32	0.3451	0.5
Galliformes	1			0.34	0.0076	0.01
cf. *Meleagris gallopavo* possible Turkey	5			3.94	0.0773	0.1
Meleagris gallopavo Turkey	12	5	3.9	28.02	0.4614	0.6
Alligator mississippiensis Alligator	1	1	0.8	15.49	0.1991	0.3
UID Turtle	456			118.01	1.2435	1.6
Kinosternidae Mud and Musk turtles	37	8	6.2	11.20	0.2579	0.3
Emydidae Pond and Box turtles	4			4.40	0.0853	0.1
Pseudemys spp. Pond turtle	44	5	3.9	61.18	0.5985	0.8
Terrapene carolina Box turtle	27	1	0.8	26.35	0.2831	0.4
Trionyx spp. Softshell turtle	131	4	3.1	116.62	0.9796	1.3
UID Snake	7			0.73	0.0098	0.01
Colubridae Non-poisonous snakes	7	2	1.6	0.90	0.0124	0.02
UID Amphibian	1			0.15		
Anura Frog/Toad	12	3	2.3	0.24		
Odontaspis taurus Sand tiger shark	1			0.19		
Lamnidae Mackerel shark	1			0.66		
Galeocerdo cuvieri Tiger shark	2			1.90		
UID Fish	395			26.35	0.5765	0.8

Table 6.—*Lewis Site: Species List.*

Taxon	Cnt	MNI		Weight	Biomass	
		#	%	(gm)	kg	%
Acipenser spp. Sturgeon	6	2	1.6	0.94	0.0332	0.04
Lepisosteus spp. Gar	56	11	8.5	5.48	0.1632	0.2
Amia calva Bowfin	6	3	2.3	1.10	0.0376	0.05
Clupeidae Herrings	17	4	3.1	0.23	0.0113	0.01
cf. *Esox* spp. possible Pickerel	1			0.02	0.0085	0.01
Esox spp. Pickerel	1	1	0.8	0.68	0.0223	0.03
Catostomidae Suckers	1	1	0.8	0.02	0.0014	tr
cf. *Ictalurus* spp. possible Bullhead catfish	1			0.13	0.0029	tr
Ictalurus spp. Bullhead catfish	33	16	12.4	7.99	0.1529	0.2
Noturus spp. Madtom	1	1	0.8	0.04	0.0009	tr
Centrarchidae Sunfishes	9			0.63	0.0154	0.02
Micropterus spp. Bass	3	2	1.6	1.60	0.0285	0.04
UID Vertebrate				667.92		
TOTALS	7169	129		6695.56	77.3699	

The horse and the three sharks are not subsistence refuse. The horse was a Pleistocene species, although the exact species was not determined. The site is deposited on a Pleistocene formation and the element is from one of the lower strata, Level D. It could have been mixed with the archaeological materials. The sharks were identified from fossilized teeth recovered from Levels D, F, and E. These are also strata at the lower levels of the site so that the teeth may be incidental inclusions in the archaeological deposit. While it is unlikely that the horse was associated with human activity (in the absence of Paleo-Indian artifacts), the possibility remains that the sharks may have been brought to the site by human action and represent trade with coastal groups.

Based on MNI, the collection is moderately diverse, but highly equitable (Table 5), indicating that a few taxa are very abundant in the collection, the remaining taxa less so, but relatively equal in abundance. The abundant taxa are deer, bullhead catfish, and gar. When diversity is calculated using biomass, the prominance of venison is highlighted. Biomass diversity is very low and suggests low equitability. Deer contributed most of the biomass represented in this collection. The diversity values suggest an overall adaptation which included a moderately diverse range of taxa, but emphasized a single source for most of the meat.

PIEDMONT

In the upper Savannah River Valley data are available from three sites, all excavated as a result of construction of the Richard B. Russell Reservoir. The Beaverdam Creek site (9EB85) contained an earthlodge, platform mound, and village. It was excavated by the University of Georgia under the direction of David Hally and James Rudolph (Rudolph and Hally 1985). The Beaverdam Creek site was a small ceremonial and political center occupied during the Savannah II Phase, between AD 1200 and 1300 (Anderson *et al.* 1986). The site was located on a floodplain north and east of Beaverdam Creek, less than a kilometer from the Savannah River. A 1/4-inch mesh screen was used to recover most of the materials. In addition, faunal materials were recovered by fine screen processing. For purposes of determining MNI, features were considered separate components, as were the non-feature deposits referred to as the gray ashy layer associated with the mound, the village midden, and pre-mound midden.

The collection contained 7,573 bones, in poor condition, and the remains of at least 161 individuals. (Tables 3, 4, and 7; Reitz 1985b). Contrary to expectations, the fine-screen sample contained no new species compared to the 1/4-inch materials, although 21% of the fish individuals were found in the fine-screen samples. Terrestrial mammals accounted for 35% of the individuals identified from the site with deer contributing 22% of the individuals in the collection. Although other bird taxa were identified, turkeys were the major species. The assemblage contained similar numbers of turtle and fish individuals. The taxa identified suggest warm weather activity, however the possibility of winter occupation cannot be eliminated.

Table 7.—*Beaverdam Creek Site: Species List.*

Taxon	Cnt	MNI		Weight	Biomass	
		#	%	(gm)	kg	%
UID Mammal	1784			2029.5	24.9259	34.1
Didelphis virginiana Opossum	5	2	1.2	7.1	0.1535	0.2
cf. *Sylvilagus* spp. possible Rabbit	5			2.2	0.0535	0.07
Sylvilagus spp. Rabbit	15	5	3.1	4.7	0.1049	0.1
UID Rodent	8			0.4	0.0123	0.02
Sciurus spp. Squirrel	4			0.6	0.0169	0.02
Sciurus carolinensis Grey squirrel	1	1	0.6	0.1	0.0033	tr

Table 7.—*Beaverdam Creek Site: Species List.* (continued)

Taxon	Cnt	MNI #	MNI %	Weight (gm)	Biomass kg	Biomass %
Sciurus niger Fox squirrel	3	3	1.9	0.7	0.0191	0.03
cf. *Tamias striatus* possible Chipmunk	1	1	0.6	0.1	0.0033	tr
Castor canadensis Beaver	2	1	0.6	2.1	0.0513	0.07
Peromyscus spp. New World mouse	4	4	2.5	0.3	0.0089	0.01
Ondatra zibethicus Muskrat	2	1	0.6	2.9	0.0686	0.09
Sigmodon hispidus Hispid cotton rat	25	1	0.6	0.3	0.0089	0.01
Carnivore	1			0.2	0.0062	0.01
cf. *Urocyon cinereoargenteus* possible Gray fox	2			1.4	0.0356	0.05
Urocyon cinereoargenteus Gray fox	3	2	1.2	1.6	0.0402	0.06
Procyon lotor Raccoon	1	1	0.6	0.4	0.0115	0.02
cf. *Mephitis mephitis* possible Striped skunk	1			0.2	0.0062	0.01
Mephitis mephitis Striped skunk	3	1	0.6	2.3	0.0557	0.08
Felis rufus Bobcat	1	1	0.6	5.9	0.1299	0.2
cf. *Odocoileus virginianus* possible Deer	8			5.3	0.1188	0.2
Odocoileus virginianus Deer	653	35	21.7	3075.5	36.2347	49.6
UID Bird	695			256.8	3.1819	4.4
Cathartes aura Turkey vulture	4	3	1.9	7.9	0.1330	0.2
Meleagris gallopavo Turkey	37	7	4.4	104.6	1.4052	1.9

Table 7.—*Beaverdam Creek Site: Species List.* (continued)

Taxon	Cnt	MNI #	MNI %	Weight (gm)	Biomass kg	Biomass %
Ectopistes migratorius Passenger pigeon	1	1	0.6	0.2	0.0047	0.01
UID Turtle	924			249.1	1.2751	1.8
Chelydra serpentina Snapping turtle	3	1	0.6	4.7	0.0888	0.1
Kinosternon cf. *subrubrum* Mud turtle	3	1	0.6	1.2	0.0357	0.05
Emydidae Pond and Box turtles	75			49.3	0.4305	0.6
Pseudemys spp. Pond turtle	48	7	4.4	55.7	0.4672	0.6
Terrapene carolina Box turtle	190	11	6.8	273.0	1.3560	1.9
Trionyx cf. *spiniferus* Softshell turtle	113	13	8.1	87.3	0.6318	0.9
UID Snake	33			1.6	0.0218	0.03
Colubridae Non-poisonous snakes	27	6	3.7	3.2	0.0447	0.06
Viperidae Pit vipers	1	1	0.6	0.4	0.0055	0.01
Anura Frog/Toad	4	3	1.9	0.5		
UID Fish	2522			81.9	1.0460	1.4
Lepisosteus spp. Gar	117	9	5.6	10.8	0.1983	0.3
Catostomidae Suckers	134	14	8.7	22.4	0.3516	0.5
Minytrema melanops Spotted sucker	3	2	1.2	0.3	0.0117	0.02
Ictaluridae Bullhead catfishes	86	15	9.3	10.6	0.1871	0.3
Ictalurus catus White catfish	1			0.2	0.0043	0.01
Ictalurus punctatus Channel catfish	1			0.1	0.0022	tr

Table 7.—*Beaverdam Creek Site: Species List.* (continued)

Taxon	Cnt	MNI #	MNI %	Weight (gm)	Biomass kg	Biomass %
Centrarchidae Sunfishes	5			0.1	0.0029	tr
Lepomis spp. Sunfish	7	4	2.5	0.5	0.0705	0.1
Micropterus spp. Bass	1			0.1	0.0025	tr
Micropterus salmoides Largemouth bass	4	2	1.2	0.8	0.0144	0.02
cf. *Pomoxis nigromaculatus* possible Black crappie	1	1	0.6	0.1	0.0025	tr
cf. *Aplodinotus grunniens* possible Freshwater drum	1	1	0.6	0.02	0.0022	tr
UID Vertebrate				1649.8		
TOTALS	7573	161		8017.02	73.0473	

Diversity and equitability are very similar to the Lewis Site. The MNI diversity (Table 5) suggests a strategy in which deer were the central component, supplemented by a wide range of other taxa. This pattern indicates that resources from several biotopes were included in the subsistence strategy. While deer represent exploitation of terrestrial biotopes, 47% of the individuals identified were from aquatic biotopes. Biomass diversity is very low and the equitability also is low.

The smallest of the Russell collections is from Clyde Gulley (9EB387). This small village was located at the confluence of Pickens Creek and the Savannah River and was excavated by the South Carolina Institute of Archaeology and Anthropology under the direction of William H. Marquardt and Ann Tippitt (Tippitt and Marquardt 1984). The assemblage, recovered using 1/8-inch mesh and flotation, contained 1,479 bones and 7 individuals and was dated to Early Etowah Phase, AD 900 to AD 1000 (Mississippian Period). The vertebrate materials were poorly preserved (Ruff 1982). The largest number of bones was from mammals, followed closely by turtles. Deer was the only mammalian taxon identified and contributed 14% of the fragments, as did birds. Reptiles including mud or musk turtles and a softshell turtle, contributed 43%, and fishes, which included two bullhead catfish individuals, contributed 29% of the fragments. It is interesting that reptiles formed an even larger percentage of the fragments in this small collection than in larger ones.

The third vertebrate assemblage studied from the Russell Reservoir construction area is Rucker's Bottom (9EB91; Anderson and Schuldenrein 1983; 1985). This village was located on the Savannah River 12 km upstream from Beaverdam Creek and was excavated by David Anderson and Joseph Schuldenrein, Commonwealth Associates, Inc. The majority of the materials were from Mississippian features associated with living floors, refuse pits and small middens found in and around the village, although some Early Woodland fauna, probably with some Archaic remains intermixed, were also recovered. Only the Mississippina fauna are reported herein. Rucker's Bottom may have been a subsidiary village to Beaverdam Creek and was occupied primarily between AD 1200-1450 (Anderson *et al.* 1986). Flotation samples were not studied intensively; however, they were scanned for new species (Scott 1985). A single additional taxon not found in the 1/4-inch fraction was identified in the smaller fraction. This was a minnow (Cyprinidae), suggesting that the 1/4-inch samples can be used to interpret the vertebrate subsistence strategy, although the number of fish individuals may be under-represented. Table 8 presents data the 1/4-inch fraction only. The Mississippian sample contained 13,015 bones and at least 384 individuals (Tables 3, 4, and 8). Although the species identified from Rucker's Bottom are very similar to those from nearby Beaverdam Creek, the proportions in which those taxa were used differ.

Table 8.—*Rucker's Bottom: Mississippian Species List.*

Taxon	Cnt	MNI		Weight	Biomass	
		#	%	(gm)	kg	%
UID Large Mammal	8517			4112.8	47.1708	43.3
UID Small Mammal	313			81.7	1.3836	1.3
Didelphis virginiana Opossum	10	5	1.3	9.7	0.2033	0.2
Sylvilagus spp. Rabbit	7	2	0.5	0.8	0.0215	0.02
Sylvilagus floridanus Cottontail rabbit	5	5	1.3	1.6	0.0402	0.04
Sciurus spp. Squirrel	2			0.2	0.0062	0.01
Sciurus carolinensis Grey squirrel	6	5	1.3	1.2	0.0310	0.03
Sciurus niger Fox squirrel	6	5	1.3	2.1	0.0513	0.05
Marmota monax Woodchuck	1	1	0.3	0.7	0.0191	0.02
Castor canadensis Beaver	4	3	0.8	6.3	0.1378	0.1
Cricetidae New World mice	5	1	0.3	0.3	0.0089	0.01
Peromyscus spp. New World mouse	7	2	0.5	0.3	0.0089	0.01
Carnivore	5			2.9	0.0686	0.06
Canis niger Wolf	2	2	0.5	1.8	0.0446	0.04
Urocyon cinereoargenteus Grey fox	3	2	0.5	0.8	0.0215	0.02
Ursus americanus Black bear	9	5	1.3	87.4	1.4701	1.4
Procyon lotor Raccoon	10	6	1.6	9.7	0.2033	0.2

Table 8.—*Rucker's Bottom: Mississippian Species List.* (continued)

Taxon	Cnt	MNI		Weight	Biomass	
		#	%	(gm)	kg	%
Mephitis mephitis Striped skunk	14	2	0.5	4.3	0.0978	0.09
Felis rufus Bobcat	1	1	0.3	1.3	0.0333	0.03
Odocoileus virginianus Deer	1335	137	35.8	4210.8	48.076	44.2
UID Large Bird	664			196.8	2.4978	2.3
UID Small/Medium Bird	102			16.8	0.2661	0.2
Meleagris gallopavo Turkey	66	22	5.7	201.7	2.5544	2.4
Ectopistes migratorius Passenger pigeon	2	2	0.5	0.5	0.0109	0.01
UID Turtle	1332			301.8	1.4501	1.3
Chelydra serpentina Snapping turtle	8	6	1.6	13.8	0.1835	0.2
Kinosternidae Mud and Musk turtles	14	4	1.0	4.1	0.0814	0.07
Kinosternon subrubrum Mud turtle	3	1	0.3	1.3	0.0377	0.03
Sternotherus spp. Musk turtle	1	1	0.3	1.1	0.0337	0.03
Emydidae Pond and Box turtles	10	1	0.3	7.5	0.1220	0.1
Pseudemys spp. Pond turtle	29	12	3.1	25.1	0.274	0.3
Pseudemys concinna/floridana Pond turtle	1	1	0.3	1.5	0.0415	0.04
Terrapene carolina Box turtle	109	32	8.4	192.8	1.074	1.0
Trionyx spp. Softshell turtle	39	7	1.8	16.3	0.2052	0.2
UID Snake	7			1.0	0.0138	0.01
Colubridae Non-poisonous snakes	11	4	1.0	2.1	0.0292	0.03
Coluber/Masticophis spp. Racer/coachwhip	11	9	2.3	1.7	0.0236	0.02
Lampropeltis/Elaphe spp. Corn/Rat/King snakes	14	7	1.8	3.6	0.0503	0.05
Nerodia spp. Water snake	1	1	0.3	0.2	0.0027	tr
Viperidae Pit vipers	9	6	1.6	3.5	0.0489	0.04
Anura Frog/Toad	14	2	0.5	1.9		

Table 8.—*Rucker's Bottom: Mississippian Species List.* (continued)

Taxon	Cnt	MNI #	MNI %	Weight (gm)	Biomass kg	Biomass %
Rana spp. Frog	3	3	0.8	0.6		
Bufo spp. Toad	38	17	4.4	3.0		
UID Fish	154			13.9	0.2488	0.2
cf. *Acipenser* spp. possible Sturgeon	5	4	1.0	0.5	0.0175	0.02
Lepisosteus osseus Longnose gar	15	7	1.8	2.0	0.0522	0.05
Esox spp. Pickerel	1	1	0.3	0.1	0.0049	tr
Catostomidae Suckers	26	8	2.1	4.3	0.0956	0.09
Minytrema melanops Spotted sucker	6	6	1.6	1.8	0.0480	0.04
Moxostoma spp. Redhorse	18	12	3.1	3.2	0.0757	0.07
Ictaluridae Bullhead catfishes	7	1	0.3	3.1	0.0585	0.05
Ictalurus brunneus Snail bullhead	6	4	1.0	2.8	0.0531	0.05
Ictalurus catus White catfish	6	5	1.3	0.7	0.0142	0.01
Ictalurus natalis Yellow bullhead	1	1	0.3	0.2	0.0043	tr
Ictalurus punctatus Channel catfish	1	1	0.3	0.4	0.0084	0.01
Centrarchidae Sunfishes	6-	1	0.3	0.8	0.0144	0.01
Lepomis spp. Sunfish	5	4	1.0	0.6	0.0113	0.01
Micropterus spp. Bass	6	4	1.0	5.3	0.0705	0.06
Pomoxis spp. Crappie	1	1	0.3	0.2	0.0045	tr
Perca flavescens White perch	1	1	0.3	0.1	0.0025	tr
UID Vertebrate				726.4		
TOTALS	13015	383		10301.8	108.883	

The Rucker's Bottom materials appear to be very similar in diversity to those from Lewis and Beaverdam Creek (Table 5). The Rucker's Bottom sample has a very low MNI diversity and a low equitability. Although deer, toads, and box turtles are major components, most of the other taxa were used more or less evenly, with the other species represented by 1 to 6 individuals. In terms of biomass, the Rucker's Bottom sample is slightly more diverse, but even less equitable that Beaverdam.

When comparing the early Mississippian materials from Beaverdam Creek with early Mississippian materials from Rucker's Bottom, it was found that the two samples were very similar (Scott 1985:661), while the later Mississippian materials from Rucker's Bottom were quite dissimilar to the early Mississippian remains from either site. Comparing bone weight, the major difference between the early Mississippian samples from Rucker's Bottom and the material from Beaverdam Creek is that fish were more abundant in the deposits from Beaverdam Creek (Table 3), possibly because of the inclusion of flotation materials in the Beaverdam species list. Such fine-screened materials usually contain larger quantities of fish than found in 1/4-inch screened samples, and 21% of the fish individuals in the Beaverdam collection were from the fine-screened samples. The Mississippian materials provide evidence for a warm season occupation; evidence for a winter occupation could not be demonstrated. The later Mississippian Rucker's Bottom assemblage appears to have been the result of a winter occupation. It differs from the early Mississippian sample from Rucker's Bottom and that from Beaverdam Creek in that large mammal bones contribute an overwhelming percent of the Rucker's Bottom sample.

DISCUSSION

Comparison of the vertebrate data from these sites shows more similarities than dissimilarities. In spite of the collections having had inconsistent sample characteristics, the subsistence strategy reflected by the noncoastal samples appears consistent, regardless of whether the sites are above or below the Fall Line. This is a surprising result since it could be expected that the distinct physiographic zones represented by the coastal plain and the piedmont sections of the river valley would elicit distinctive subsistence responses. The samples are also from a series of different temporal units, some of which are associated with horticulture and others of which are not. It was anticipated that pre-Mississippian vertebrate exploitation would differ substantially from Mississippian vertebrate exploitation if only because of the time and labor required for horiticultural activities. Perhaps this was not the case. It must also be acknowledged that these similarities may be due to the gross level of temporal analysis. It is probable that by lumping large temporal units some artificial homogeneity has been created.

The only collection which appears dissimilar to the others is 38JA61. The location of this site in the upper reaches of the Savannah esuarine system accounts for the presence of estuarine taxa in the collection. The unique nature of estuarine assemblages has been discussed previously (Reitz 1985a). The collection from 38JA61 represents the special way in which people adapted to the riches of those systems by using large numbers of fishes. Interestingly, however, even 38JA61 seems to contain more freshwater turtles than sites located in the lower reaches of other estuaries and on the barrier islands.

The most typical characteristic of the non-coastal samples is the high presence of deer in combination with a high use of turtles. Deer was the predominant taxon, followed by either softshell turtles, snapping turtles, or pond turtles. There may be some evidence that more turtles, and birds, were used than other taxa at sites above the Fall Line. There is also some evidence to suggest that deer are more abundant in Mississippian deposits than in earlier ones.

In sharp contrast to 38JA61 and other coastal sites, very few fish taxa appear to have been exploited at sites from the coastal plain into the piedmont. Few anadromous individuals were identified. Perhaps such fishes were not used, or depositional processes have mitigated against their recovery. Interestingly, the only members of the herring family for which measurements are avilable indicate that the individuals which may have been used were at the small end of the size range rather than large adults (Reitz and Frank 1985).

Birds, other than turkeys, are virtually absent from the collections. Only two passenger pigeons have been identified, suggesting either that they were not exploited in the numbers historically reported, or that the sites were not occupied during months when these birds were present. The Savannah River Valley is within the former winter range of passenger pigeons, and they also nested along the coast (Schorger 1955:264, 269), so the latter explanation seems unlikely.

Interestingly, the two sites which are most similar to one another chronologically and geographically (Beaverdam and Rucker's Bottom) have faunal collections which reflect dissimilar amounts of deer, turtles, and fish. This difference is most apparent in MNI and in fragment count and might be accounted for because of different activities at the two sites, one being a ceremonial center and the other being residential in nature. The earthlodge, and later the mound at the Beaverdam Creek site, may have been associated with special functions which affected the subsistence effort. It is also possible that the differences reflect the fact that the fine-screened portion of the Beaverdam sample was quantified and contained more fish while the fine-screened sample from Rucker's Bottom was not quantified. However, the Rucker's Bottom fine-screen component appears not to have had the number of fish found at Beaverdam.

In terms of technologies and habitats involved, it appears that a diverse number of methods and locations were used. Many of the mammals are crepuscular or noctural and would best have been captured with traps rather than being actively hunted. Many of the turtles, such as the box turtles, could have been collected in conjunction with other activities or caught with fish hooks. The pond turtles could also have been captured in traps hung below logs. The fish could have been captured using hook and line (either hand-held or set), traps, weirs, spears, poisons in quiet waters, or nets. A variety of water conditions probably were exploited. These included quiet backwaters of the main river for animals such as bowfin, gar, and many sunfishes, and small rivers with some current present for pickerels and suckers.

It is interesting that the diversity and equitability values for Beaverdam Creek, the Lewis Site, and Rucker's Bottom are so similar. The three collections are all moderately diverse and highly equitable in terms of MNI but have low biomass diversity and equitability. This pattern suggests that the subsistence strategies developed on the upper coastal plain and the piedmont were similar, in spite of geographical and temporal differences. The river itself, transecting these other geographical subdivisions, was the significant biotope in the development of subsistence strategies in the valley. Strategies were designed to take advantage of the riverine resources available to supplement deer, which could also be taken along the river's edge.

Other factors played a role in subsistence strategies. Use of plant resources, primarily domesticated ones, changed through time. It is also probable that interactions among humans living in the valley and those living outside of it changed with time. However, within the valley it appears that full advantage was taken of aquatic resources to supplement a diet in which venison figured prominently throughout the time periods represented in this study. Even at 38JA61, the strategy appears to have been designed to obtain a variety of easily captured lowland and riverine/estuarine species to supplement deer.

CONCLUSION

A survey such as this one is of necessity too general. However, it serves to point out areas where additional attention may be focused in the future. Biological evidence for subsistence in the Savannah River Valley is limited. Based on available evidence it appears that, except for the lower coastal plain, subsistence strategies involving animals were very similar from the Late Archaic into the Mississippian Period throughout the length of the valley. That strategy incorporated deer and a variety of riverine turtles and fishes. This review also highlights the need for special care in the recovery and study of biological remains.

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Alkaloids: Chemical and Biological Perspectives. Volume 5. Pelletier, S. William (ed.). New York: John Wiley & Sons (A Wiley-Interscience Publication). 1987. Pp. xiii + 714. $100.00.

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Richard Evans Schultes
Professor of Biology Emeritus
Botanical Museum
Harvard University
Cambridge, MA 02138

The First Resource: Wild Species in the North American Economy. Prescott-Allen, C. and R. Prescott-Allen. New Haven: Yale University Press. Pp. xv + 529, 33 figs., 128 tables. $62.00.

There has never before been a treatment published that is so full of statistical material on what has generally been considered a flora that has given little to the benefit of human affairs. This work is so thoroughly detailed and widely-inclusive that it is not possible to review here all of the statistical data that support the major premises of the monograph.

Sponsored by the World Wildlife Foundation, it discusses the many aspects of the use of the North American floras from the point of view of "wild" plants that enter or can enter into the economy of the region. While several minor treatments of this general aspect of economic botany have appeared, I know of no other volume that packs so much convincing statistical information into one contribution.